COLD WEATHER INJURY PREVENTION

(individual edition)

Preventive Medicine

(modified for USAREUR)

Introduction

- Cold makes tasks more difficult, not impossible
- Prevention of cold injuries is a Command Responsibility
- ALL COLD WEATHER INJURIES ARE PREVENTABLE!!!

Outline

- Susceptibility Factors
- Types of Cold Weather Injuries
- Guidance for Cold Weather Operations
  - Clothing and Equipment
  - Food/Water
  - Personal Hygiene
  - Work Practices
- Conclusion

Is This You?

- Male
- E-4 or below
- Approximately 20 years old
- From a warm climate
- Less than 18 months time in service
- Uses tobacco, alcohol or medications
- Neglects proper foot care

Susceptibility Factors

- Previous cold weather injury
- Inadequate nutrition
- Alcohol, caffeine, nicotine
- Dehydration
- Overactivity/Underactivity
- Long exposure to the cold
- Poor clothing and equip
- Sick or injured
- Acclimatization
- Ethnic/geographic origin
- Wind, cold, rain
- Age
- Discipline
- Physical stamina
- Inadequate training

Types of Cold Weather Injuries

- Chilblains
- Immersion/Trench Foot
- Frostnip/Frostbite
- Hypothermia
- Snow Blindness
- Carbon Monoxide Poisoning
- Dehydration
- Heat Exhaustion

Guidance for Cold Weather Operations

- Clothing and Equipment
  - your 1st line of defense
- Food and Water Requirements
- Personal Hygiene and Field Sanitation
- Work Practices

Clothing Principles

Insulate/Layer/Ventilation

The acronym **CoLD** should be used when dressing for cold weather.

Keep it **C**lean.
Avoid **O**verheating.
Wear it **L**oose and Layered.
Keep it **D**ry.

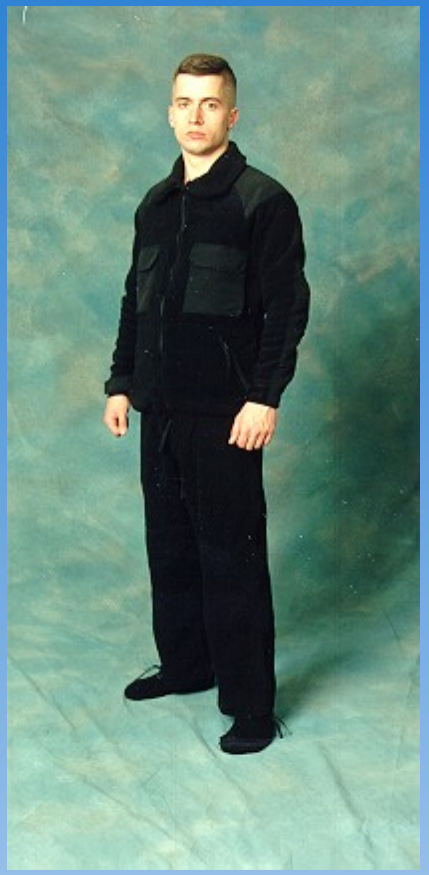
Extended Cold Weather Clothing System (ECWCS)

- Do you wear it well?
  - Polypropylene shirt/pants
    - Liner coat/trousers
    - Gore-tex coat/trousers
    - Cold weather boots
  - Handwear and accessories

ECWCS: Inner Layer

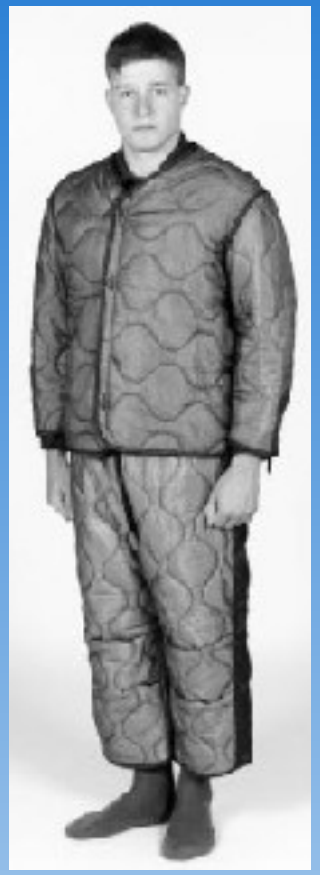
- **Polypropylene Expedition Weight Underwear**
- Primary wicking layer
- Worn directly next to the skin – no underwear!
- Zippered turtleneck for ventilation
- Use when 0°F and below

ECWCS: Intermediate Layer



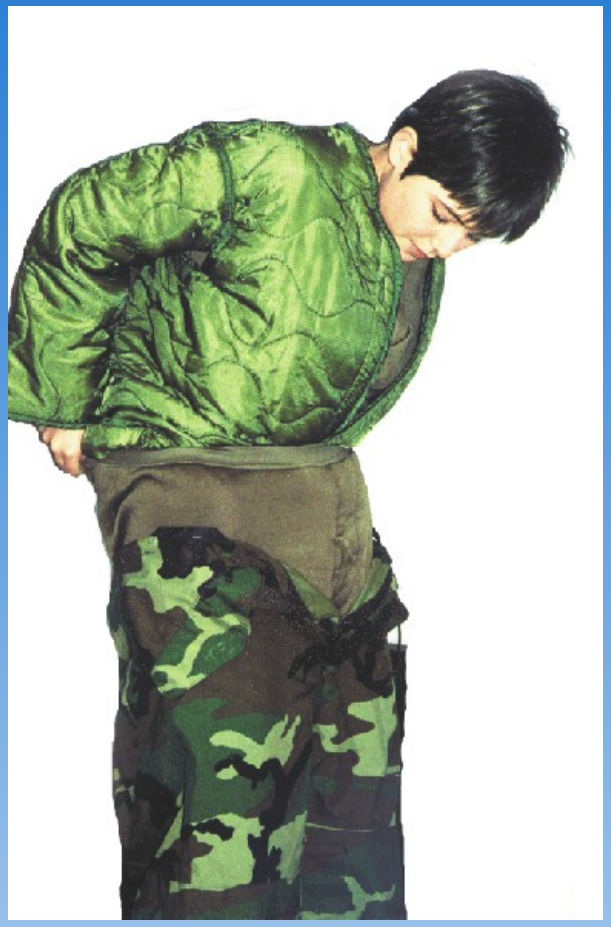
- **Polyester Fleece Jacket and Bib Overall**
- Primary insulation layer
- High backed bib
- Quick release suspenders

ECWCS: Intermediate Layer



- **Cold Weather Coat and Trouser Liners**
- Polyester dumbell quilted batting
- Secondary insulation layer for extreme temperatures

ECWCS: Outer Layer



- **Gore-tex Jacket and Trousers**
- Provides water repellency and wind resistance
- Armpit zippers for ventilation
- Windbarrier layer around waist

ECWCS

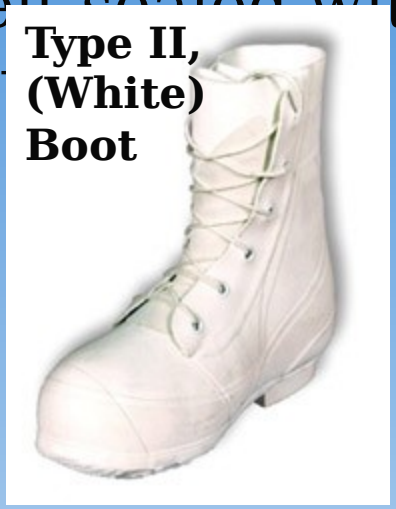
- Protects between 40°F to -60°F
- Draws perspiration away from skin and repels water to outer layer for evaporation
- Changes with wearer's needs
- No cotton or wool! (includes BDUs)

Footwear

- Intermediate Cold Wet Boot (ICWB)
  - waterproof, breathable leather with Gore-Tex liner and Thinsulate thermal insulation
  - designed to keep water out, also keep dampness in
  - (Matterhorn/Rockies)
  - 1 pr nylon/cotton/wool socks

Footwear

- The Extreme Cold Weather Boot (Vapor Barrier-VB)
  - wear when -20°F or below; protects to -40◦F inactivity and -60◦F activity
  - insulation consists of wool felt sealed with an outer and inner layer of r
  - ensure airvalve is closed
  - trousers bloused over boots
  - 1 pr wool cushion sock



Handwear

- Light-duty leather glove with wool/nylon liner
  - provides inactive person with 30 minutes of protection from frostbite at 0◦F
  - not waterproof
- Trigger finger or arctic mittens and liners
  - 0◦F or below or if more than 30 minutes of inactive exposure
  - can use trigger finger w/o liners while firing with M16
  - do not touch cold metal, POLs with bare hands

Headwear

- Balaclava
- Pile cap
- Neck gaiter
- Wool scarf

- 70-80% of lost body heat escapes through the head
- When wearing kevlar, wear pile cap or balaclava underneath

Clothing/Equipment Problems

- Malfunctions occur more often during cold-weather
- Moisture from sweat or breathing can become trapped in clothing or sleeping bags
  - minimize overdressing
  - remove clothing layers upon entering heated areas or during strenuous physical activity
  - dry clothing by hanging in the tent

Clothing/Equipment Problems

- Restricted visibility: cold eyeglasses, goggles, and eyepiece sights fog over easily when warm, moist breath passes over them or when coming in from cold to warm areas
- Depth perception is reduced at 0◦F and below. Visual acuity is reduced at -20◦F and below or windspeed is over 20 mph.
  - compensate by increasing vigilance and slowing down
  - use antifogging compounds on eyeglasses and goggles

Clothing/Equipment Problems

- Loss of manual dexterity from wearing gloves and mittens
  - Lightweight polypro glove liners can be worn
  - Do not blow warm breath into gloves
- Metal can be dangerous to touch (contact frostbite)
- Moisture will condense on cold metal exposed to heat
  - if weapons are brought inside, they should be covered and placed near the floor to minimize condensation
  - clean and dry the weapon after it warms and before returning to cold

Your Sleeping Equipment

- Modular Sleeping Bag System (MS
  - camouflage, water resistant, breathable bivy cover
  - lightweight patrol sleeping bag
  - intermediate cold weather sleeping bag
  - compression stuff sack (to store and carry the system)
  - system provides extreme cold weather protection to -50° F

Your Sleeping Equipment

- Use sleeping bag on top of sleeping mat
- Layers of tree boughs or mats under the sleeping bag help prevent heat loss to the ground
- Shake out sleeping bag before using to add air to the lining, which improves its insulation
- Air out sleeping bag daily to evaporate moisture

Your Sleeping Equipment

- In tents, sleep in long underwear and socks with all other clothing hung up to dry
- In improvised shelters, only boots and outermost clothing layer should be removed. Place clothing under the sleeping bag where it can add insulation without accumulating moisture from the body.
- Wear a balaclava while sleeping to protect the ears, neck, and face
- DO NOT put head inside sleeping bag since moisture from the breath can accumulate
- Arctic mittens can be worn on the feet while inside the sleeping bag
- No sleeping in running vehicles

Special Considerations for Tents, Heating, Ventilation

- **Precautions associated with use of stoves/heaters**
  - **Train soldiers to set up, light, refuel, and maintain**
  - **Fireguards posted when in use**
  - **Keep stove pipe clean**
  - **Ensure ventilation within the tent or enclosuer**
  - **Remove snow from ground before tents set up**
  - **(USAREUR) only approved heaters (AE Pam 385-15)**
  - **Provide carbon monoxide training**

Water Consumption

- 5-6 quarts of water/day
- Avoid caffeine, nicotine, and alcohol
- Hot juice or soup
- Protect water from freezing
- In emergency, melt snow and purify before drinking
- Dark, yellow urine is first sign of dehydration

Food Consumption

- Caloric intake increases 25-50%
- Calories needed
  - moderate exertion - 4500 calories
  - extreme exertion - 8000 calories
- 4 standard MREs per day
- Plan for hot chow, warm beverages or heat MRE

Food Consumption

- Frequently snack throughout the day
- Carry emergency rations
- Eat large snack at night to keep warmer during sleep and prevent shivering

Personal Hygiene

- Change socks 2-3 times daily
- Brush teeth daily
- Change underwear at least twice weekly
- Keep clothes clean
- Wash hands, feet, face, groin daily (canteen baths or handy wipes)
- Shave at evening if possible

Individual Cold Weather Survival Kit

- Waterproof matches and fire starters (candles)
- Signaling devices (mirror, whistle)
- Knife
- Pressure bandage, lip balm, sunglasses
- Water container (metal for use in fire)
- Compass
- Small amount of food (MRE, trail mix)
- Foil survival blanket

Work Practices

- Proper cold weather training for acclimatization
- Practice performing duties while wearing cold weather clothing
- Ensure cold weather clothing is in proper working condition
- Feet, hands, exposed skin mu
- Maintain proper hydration, n
- Minimize periods of inactivity

Work Practices

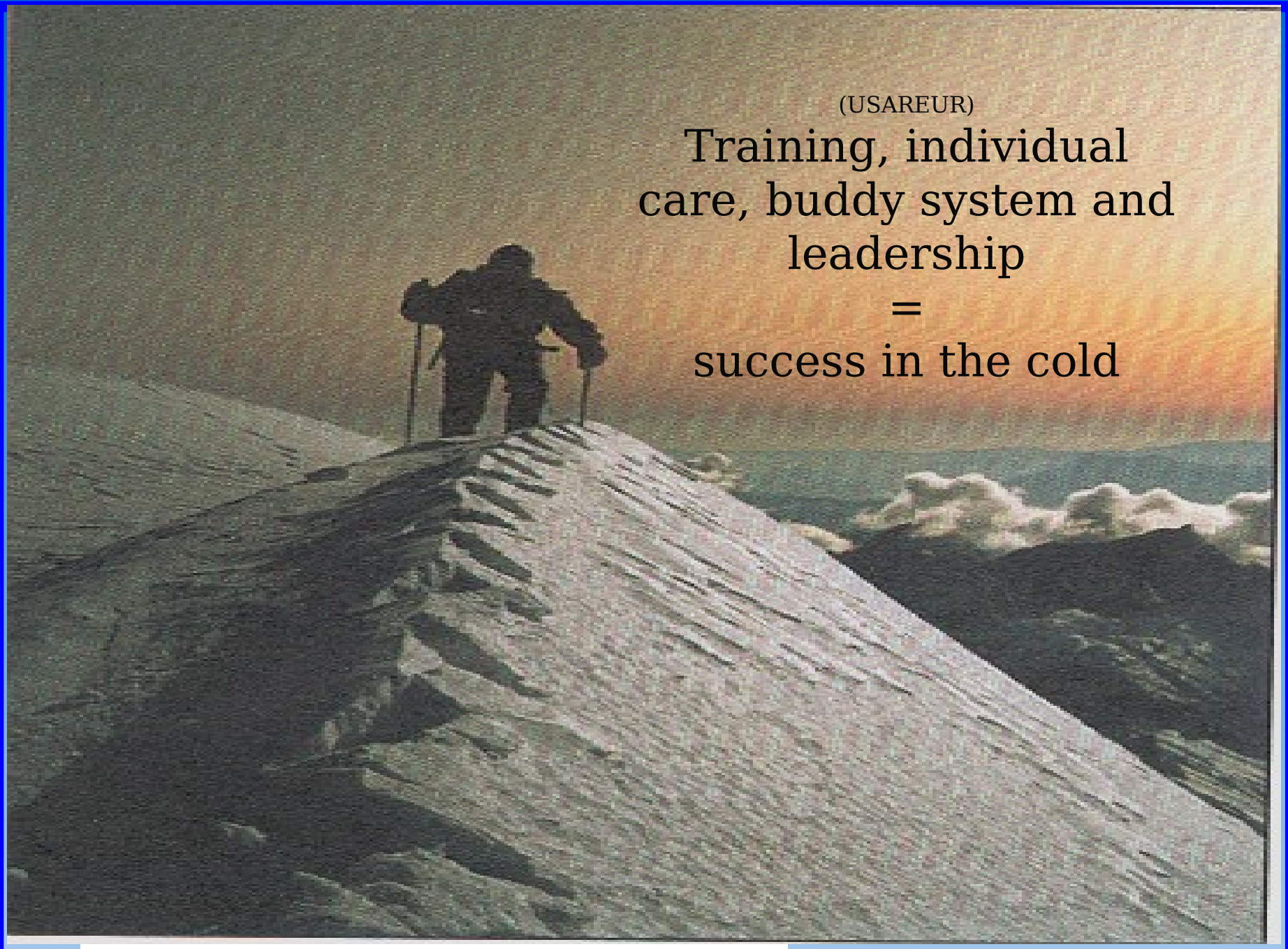
- Command emphasis on education and training
- Appropriate use of weather data, especially the wind-chill factor
- Liberal use of sick call
- Provide time and locations for thorough warming and clothing changes
- Use Field Sanitation Teams and buddy checks to prevent cold injuries

Conclusion

- Dress properly
- Drink plenty of fluids
- Eat right
- Keep in shape
- Get plenty of rest
- Minimize periods of inactivity in cold
- Maintain a positive attitude

Reference Materials

- Technical Note No. 92-2 *Sustaining Health and Performance in the Cold: Environmental Medicine Guidance for Cold-Weather Operations*
- TC 21-3 *Soldier's Handbook for Individual Operations and Survival in Cold-Weather Areas*
- FM 31-70 *Basic Cold Weather Manual*
- FM 21-10 *Field Hygiene and Sanitation*
- FM 21-11 *First Aid for Soldiers*


(USAREUR)
Training, individual care, buddy system and leadership
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success in the cold